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Computational Analysis of the Impact on India of the Uruguay Round and the Forthcoming WTO Trade Negotiations

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ABSTRACT

The Indian economy has experienced a major transformation during the decade of the 1990s. Apart from the impact of various unilateral economic reforms undertaken since 1991, the economy also had to reorient itself to the changing multilateral trade discipline within the newly written GATT/WTO framework. The unilateral trade policy measures have encompassed exchange-rate policy, foreign investment, external borrowing, import licensing, custom tariffs, and export subsidies. The multilateral aspect of India's trade policy refers to India's WTO commitments regarding trade in goods and services, trade-related investment measures, and intellectual property rights. The present study analyzes the economic effects on India and other major trading countries/regions of the Uruguay Round (UR) trade liberalization and the liberalization that might be undertaken in a new WTO negotiating round. India's welfare gain is expected to be 1.1% ($4.7 billion over its 2005 GDP) when the UR scenarios get fully implemented. The additional welfare gain is an estimated 2.7% ($11.4 billion) when the assumed future WTO round of multilateral trade liberalization is achieved. Resources would be allocated in India to the labor-intensive sectors such as textiles, clothing, leather and leather products, and food, beverages, and tobacco. These sectors would also experience growth in output and exports. Real returns to both labor and capital would increase in the economy. The scale effect (percent change in output per firm) is positive for all the ten sectors of manufacturing, indicating that Indian firms become more efficient than before. Finally, even if India undertakes unilateral trade liberalization of the order indicated in the WTO multilateral scenarios, it would still benefit, although less so than with multilateral liberalization.

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I. Introduction

The Indian economy has experienced a major transformation during the decade of the 1990s. Apart from the impact of various unilateral economic reforms undertaken since 1991, the economy has had to reorient itself to the changing multilateral trade discipline within the newly written GATT/WTO framework. The unilateral trade policy measures have encompassed exchange-rate policy, foreign investment, external borrowing, import licensing, custom tariffs and export subsidies. The multilateral aspect of India's trade policy refers to India's WTO commitments with regard to trade in goods and services, trade related investment measures, and intellectual property rights.

The multilateral trade liberalization under the auspices of the Uruguay Round Agreement and the forthcoming WTO negotiations is aimed at reducing tariff and non-tariff barriers on international trade. The purpose of our study is to provide a computational analysis of the impact of such changes in trade barriers on the economic welfare, trade, and the intersectoral allocation of resources in India and its major trading partners.

Our study is organized as follows. Section II deals with the experience of India during the 1990s with regard to its unilateral liberalization moves as well as changes induced through multilateral trade negotiations. In Section III, we present a computational analysis of the impact on India of the Uruguay Round negotiations and the prospective WTO negotiations that are presently underway and that will continue in the next few years pending a consensus on the negotiating agenda. A specially designed version of the NCAER-University of Michigan CGE

Model of World Production and Trade is used for this purpose. Conclusions and policy implications are discussed in Section IV.

II. India in the Changing Global Trade Scenario during the 1990s

Even though India's trade regime began to be liberalized in the late 1970s, 93% of its local production of internationally tradable goods continued to be protected by some type of quantitative restrictions (QRs) on imports as of 1990-91 (Pursell, 1996). The QR coverage was 94% for agricultural and 90% for manufactured intermediate, and capital goods. Import licenses were granted subject to indigenous clearance, that is, a proof that there was no source of indigenous supply. India had one of the most restrictive import-tariff structures among developing countries. The import-weighted tariff rate was 87% in 1989-90 accompanied by a collection rate of 51%. There was a rapid increase in import tariffs in the latter half of the 1980s. Such a protective regime led India into a sustained phase of allocating its resources inefficiently. Its share in world trade declined from 2% in 1950-51, 1% in 1965-66, and 0.5% by 1973-74. It continued to hover around this figure until 1990-91.

India's trade policy regime was quite complex up to the beginning of 1990s. There were various categories of importers, import licenses and methods of importing. The regime's details were contained in 19 Appendices and spanned over 200 pages. The Import and Export Policy (1990-93) was replaced by the Export and Import Policy (1992-97) with effect from April 1, 1992.[1] The content was substantially reduced to 20 pages, thus making matters simpler for exporters and importers. The new EXIM 1992-97 policy contained Negative List imports subject to licensing.[2] Almost all consumer goods remained subject to import licensing.

The first stage of India's reforms after 1991 continued to focus on manufacturing while agriculture was largely ignored. The share of value added in the manufacturing sector protected by QRs declined from 90 to 47% by May 1992 and to 36% by May 1995 (Pursell, 1996, p. 5). The corresponding decline was much less in agriculture, from 94 to 93% by May 1992 and further to 84% by May 1995.

It has been estimated that about one-third of the value of India's imports in 1998-99 were still subject to some type of NTBs (Mehta, 1998, pp. 35-36). After the EXIM Policy (April 1998) announcement, about 30% of the 10-digit tariff lines (3,068 out of 10,281) under the Harmonized System of India's trade classification (HS-ITC) were subject to NTBs.[3] The 3,068

restricted tariff lines include 1,379 lines for consumer goods. The import value of these consumer goods is only 0.2% of India's total imports, thus reflecting the relatively high degree of restrictions. The import of 40% of agricultural products is still restricted since these are classified as consumer goods.

Prior to 1991, India's import tariff rates were among the highest in the world. The Tax Reforms Committee chaired by Chelliah proposed that the import-weighted average duty rate should go down from 87% in 1989-90 to 45% in 1995-96 and further to 25% by 1998-99 (Government of India, 1993). India has lowered its average (unweighted) applied tariff rate from 125% in 1990-91 to 71% in 1993-94, 41% in 1995-96, and to 35% in 1997-98 (Table 1). The corresponding reduction in the import-weighted average has gone down from 87% in 1990-91 to 47% in 1993-94, 25% in 1995-96, and to 20% in 1997-98, thus moving ahead of the recommendations of the Chelliah Committee.[4] The peak rate of duty has declined from 355% in 1990-91 to 45% in 1997-98 and to 40% in 1999-2000.

The World Bank estimates of changes in tariffs on consumer, intermediate and capital goods are given in Table 2. Though the average import-weighted tariff rate on consumer goods has been reduced from 153% in 1990-91 to 25% in 1997-98, a large portion of this category still remains protected by QRs.

The import of some restricted items has been liberalized through freely transferable Special Import Licenses (SILs). Apart from being used as a step towards liberalization, the SIL regime also provides incentives to: large established exporters; exporters of electronic and telecommunication equipment, diamonds, gems and jewelry; and manufacturers who have acquired the prescribed quality certification.

The coverage of tariff lines has gradually expanded since their introduction in 1992-93. Tariff lines have typically moved from the restricted list to the SIL list, and thereafter to the free list. SILs were concentrated in industrial products with nearly 56% of the HS eight-digit tariff lines under SIL as on April 1, 1997. The corresponding coverage was 30% for textile and clothing products and 15% for agricultural products including fisheries (WTO, TPR-India, 1998, p. 66). The SIL coverage has been extended systematically since April 1997, freeing various items from the restricted list to the SIL list and from the SIL list to the OGL list.

Various items have also been liberalized from two of the most restricted groups, namely agro products and consumer goods. The recently freed agro products include dairy items, fish and a variety of processed foods while the consumer goods include toiletries, electronic items and cooking ranges. India's unrestrained use of QRs was strongly challenged in the WTO balance-of-payments committee by the United States, European Union, and other developed countries in December 1995.[5]

India is a founding member of the GATT (1947) as well as of the WTO, which came into effect from January 1, 1995. By virtue of its WTO membership, India automatically is availed of Most Favored Nation Treatment (MFN) and National Treatment (NT) from all WTO members for its exports and vice versa. Its participation in this increasingly rule-based system is aimed towards ensuring more stability and predictability in its international trade.

The Uruguay Round resulted in increased tariff binding commitments by developing countries. India bound 67% of its tariff lines compared to 6% prior to this round. All agricultural tariff lines and nearly 62% of the tariff lines for industrial goods are now bound. The unbound lines include some consumer goods and industrial items. Ceiling bindings for industrial goods are generally at 40% ad valorem for finished goods and 25% on intermediate goods, machinery and equipment. The phased reduction to these bound levels is to be achieved during the 10-year period commencing in 1995. Tariff rates on equipment covered under the Information Technology Agreement and software are to be brought down to zero by 2005. The only exception is in textiles in which India has kept the option of reverting to the 1990 tariff levels in case the Agreement on Textiles and Clothing does not fully materialize by 2005. It may be observed from Table 3, that applied tariff rates in India are below the Uruguay Round bound levels. The differential is greatest in the case of agriculture and also in the unprocessed primary goods categories.

Quantitative restrictions (QRs) on imports are currently maintained on Balance-of-Payments (BOP) grounds for 1,429 tariff lines at the 8-digit level. These include items relating to textiles, agriculture, consumer goods and a variety of manufactured goods. With the improvement in India's balance of payments since 1991, India has been asked to phase out its QRs. Based on presentations before the BOP Committee and subsequent consultations with India's main trading partners, an agreement has been reached to phase out QRs by 2001.

Under the Trade Related Investment Measures (TRIMS) Agreement, India has notified the TRIMs that it has maintained. These have to be eliminated by January 1, 2000. Under the Information Technology Agreement (ITA), tariffs have to be brought down to zero on 95 HS-6 digit tariff lines by the year 2000, on 4 more tariff lines by 2003, on 2 more tariff lines by 2004 and on the balance of 116 tariff lines in the year 2005. India is also committed, under the Agreement on Technical Barriers to Trade and Sanitary and Phytosanitary Measures, to establishing and administering national standards and technical regulations, keeping in view the basic precepts of MFN, National Treatment and Transparency.

With respect to services, the General Agreement on Trade in Services (GATS) has a "positive list" approach, thereby allowing WTO members to take on obligations in the sector of their choice. India has made commitments in 33 activities, as compared to an average of 23 activities for all developing countries. India's objective in the service negotiations was to offer entry to foreign service-providers in which entry was considered to be most advantageous in terms of capital inflows, technology, and employment.

Notwithstanding the recent liberalization of the foreign direct investment regime, restrictions on these investments continue to impede market access in the services sectors. Foreign equity is limited to 49% in some of the major components of telecommunications (including basic cellular, mobile, paging and other wireless services. The corresponding limit is 20% in the banking sector. Other service areas such as shipping, roads, ports, and air are beginning to open up, but foreign participation remains low. Railways remain one of the six areas reserved for the public sector, although some private sector participation is encouraged in some off-line activities. The insurance sector is still not open for private investors. Opening up of the services sectors to international competition under GATS is expected to make these sectors more efficient, which, in turn, would lead to gain in GDP of India's economy.[6]

It is evident from the preceding discussion that India has undertaken a relatively broad liberalization of its trade policy as compared to the pre-1991 period. This is true for both its unilateral and multilateral reform commitments. However, much more remains to be done particularly since the tariff barriers continue to remain relatively high. Also, many consumer-goods imports are still constrained.

With the foregoing as background, we turn now to a computational analysis of the trade-liberalization provisions in the Uruguay Round and some possible liberalization efforts in the forthcoming WTO round of trade negotiations.

III. Computational Analysis of India's Trade Reforms in a Global Setting

The empirical evidence from a number of studies points to a strong and significant effect of openness to trade on growth performance (Srinivasan, 1998). Thus, it is expected that the multilateral liberalization of trade should benefit countries of the world in general. In this section we will analyze the impact of trade liberalization provisions in the Uruguay Round and some possible liberalization efforts in the forthcoming WTO round of negotiations. For comparative purposes, we shall also analyze hypothetical scenarios when only India undertakes unilateral liberalization. For this purpose we use simulation analysis to assess the potential economic effects arising from the implementation of the various liberalization provisions. The simulations are based on a special version of the NCAER-University of Michigan computable general equilibrium (CGE) patterned after the Michigan Model of World Production and Trade. The main features of the model are described in Stern et al. (2000) and Chadha et al. (1999), and the equations and other details are available on the University of Michigan website: www.umich.spp.edu/rsie/. The country/region and sectoral coverage of the model are noted in Tables 4 and 5.

Computational Scenarios

The main data source for the model is "The GTAP-4 Database" (McDougall et al., 1998), which refers to 1995. For purposes of analysis, we have projected this database from 1995 to 2005. This provides us with an approximate picture of what the world could be expected to look like in 2005 assuming that the Uruguay Round (UR) Agreement reached in 1995 had not existed. We then analyze the impact of the UR-induced changes that may occur during the 10-year implementation period after 1995 with respect to reduction/removal of tariff and non-tariff barriers on trade. The scaled-up database of 2005 is then readjusted to mimic the world as it might look once the UR Agreement had been fully implemented. We then carry out some liberalization scenarios for WTO negotiations that involve possible reductions in tariffs on agriculture and manufacturing and reductions of barriers to services trade and FDI.

The computational scenarios are as follows:

UR1 *Agreement on Textiles and Clothing (ATC) is analyzed by simulating the effects of the Multi-Fibre Arrangement (MFA) phase-out under the Uruguay-Round (UR) agreement. This is done through bringing the export-tax equivalents of the MFA-affected developing countries/regions down to zero.*[7]

UR2 *All the countries/regions reduce their bilateral import tariffs as per the UR agreement on the agriculture, mining, and manufacturing sectors along with complete elimination of export-tax equivalents by all the countries/regions in these sectors. This experiment includes removal of the MFA quota constraints (i.e., UR1).*

On the basis of the foregoing scenarios, we adjusted the projected 2005 database for the changes brought about by the UR agreement. We then proceed to run the following scenarios for the new WTO negotiating round, which we refer to as the Millennium Round (MR):[8]

MR1 *All the countries/regions reduce their bilateral import tariffs on agriculture by 33 percent.*

MR2 *All the countries/regions reduce their bilateral import tariffs on minerals and manufactured products by 33 percent.*

MR3 *All countries/regions reduce the import-tariff equivalents of NTBs on service sectors by 33 percent.*[9]

MR4 *All three scenarios (MR1, MR2 and MR3) combined*

Finally, for purposes of comparison with the multilateral MR scenarios, we have run the following unilateral liberalization scenarios for India alone:

UNIMR1 *India reduces its post-UR import tariffs on agriculture by 33 percent.*

UNIMR2 *India reduces its post-UR tariffs on the mining and manufacturing sectors by 33 percent.*

UNIMR3 *India reduces its tariff equivalents on services by 33 percent*

UNIMR4 *All three scenarios (UNIMR1, UNIMR2 and UNIMR3) combined*

Aggregate Computational Results

Tables 6-11 provide aggregate, or economy-wide, results from the multilateral scenarios as mentioned above for the 20 countries/regions that have been modeled. The results reported include: absolute changes in imports, exports, and equivalent variation (a measure of economic welfare); and percentage changes in the terms of trade, equivalent variation, real wage rate, and the real return to capital. Disaggregated sectoral results for India for the UR4 and MR4 scenarios are presented in Tables 12-13.

To help the reader interpret the results, it is useful to review the features of the model that serve to identify the various economic effects that are being captured in the different scenarios. Although the model includes the imperfect-competition features of the New Trade Theory,[10] it remains the case that markets respond to trade liberalization in much the same way that they would with perfect competition. That is, when tariffs or other trade barriers are reduced in a sector, domestic buyers (both final and intermediate) substitute toward imports and the domestic-competing industry contracts production while foreign exporters expand. With multilateral liberalization reducing tariffs and other trade barriers simultaneously in most sectors and countries, each country's industries share in both of these effects, expanding or contracting depending primarily on whether their protection is reduced more or less than in other sectors and countries. At the same time, countries with larger average tariff reductions than their trading partners tend to experience a real depreciation of their currencies in order to maintain a constant trade balance, so that all countries therefore experience mixtures of both expanding and contracting sectors.

Worldwide, these changes cause increased international demand for all sectors, with world prices rising most for those sectors where trade barriers fall the most. This in turn causes changes in countries' terms of trade that can be positive or negative. Those countries that are net exporters of goods with the greatest degree of liberalization will experience increases in their terms of trade as the world prices of their exports rise relative to their imports. The reverse occurs for net exporters in industries where liberalization is slight—perhaps because it already happened in previous trade rounds.

The effects on the welfare of countries arise from a mixture of these terms-of-trade effects, together with the standard efficiency gains from trade and also from additional benefits

due to elements of the New Trade Theory. Thus, we expect on average that the world will gain from multilateral liberalization, as resources are reallocated to those sectors in each country where there is a comparative advantage. In the absence of terms-of-trade effects, these efficiency gains should raise national welfare (our "equivalent variation") for every country, although some factor owners within a country may lose. However, it is possible for a particular country whose net imports are concentrated in sectors with the greatest liberalization to lose overall, if the worsening of its terms of trade swamps these efficiency gains.

On the other hand, although the New Trade Theory is perhaps best known for introducing new reasons why countries may lose from trade, in fact its greatest contribution is to expand the list of reasons for gains from trade. It is these that are the dominant contribution of the New Trade Theory in our model. That is, trade liberalization permits all countries to expand their export sectors at the same time that all sectors compete more closely with a larger number of competing varieties from abroad. As a result, countries as a whole gain from lower costs due to increasing returns to scale, lower monopoly distortions due to greater competition, and reduced costs and/or increased utility due to greater product variety. All of these effects make it more likely that countries will gain from liberalization in ways that are shared across the entire population.

In perfectly competitive trade models such as the Heckscher-Ohlin Model, one expects countries as a whole to gain from trade, but the owners of one factor—the "scarce factor"—to lose through the mechanism known as the Stolper-Samuelson Theorem. The additional sources of gain from trade due to increasing returns to scale, competition, and product variety, however, are shared across factors, and we routinely find in our CGE modeling that both labor and capital often gain from liberalization.[11] That is often the case here.

A final point to note concerns the modeling and role of nontariff barriers, such as are included here especially in agriculture and textiles and apparel. These are quantitative restrictions, captured in the model by endogenous tariff equivalents that rise and fall with changing supplies and demands for trade. The tariff equivalents generate quota rents that accrue to whatever group is granted the rights to trade under the restriction, which in the case of the MFA is the textiles-and-apparel exporting countries. Liberalization of these nontariff barriers reduces or eliminates these quota rents, and this can be costly to those who possessed them

disproportionately beforehand. Therefore, it is not the case that exporting countries necessarily benefit from relaxation of these trade barriers, since their loss of quota rents can more than outweigh their gains from increased exports. Indeed, their exports can actually decline, along with their national welfare, if increased exports from other countries displace them in world markets.

In the real world, all of these effects occur over time, some of them more quickly than others. Our model is however static, based upon a single set of equilibrium conditions rather than relationships that vary over time. Our results therefore refer to a time horizon that is somewhat uncertain, depending on the assumptions that have been made about which variables do and do not adjust to changing market conditions, and on the short- or long-run nature of these adjustments. Because our elasticities of supply and demand reflect relatively long-run adjustments and because we assume that markets for both labor and capital clear within countries, our results are appropriate for a relatively long time horizon of several years – perhaps two or three at a minimum.

On the other hand, our model does not allow for the very long-run adjustments that could occur through capital accumulation, population growth, and technological change. Our results should therefore be thought of as being superimposed upon longer-run growth paths of the economies involved. To the extent that these growth paths themselves may be influenced by trade liberalization, therefore, our model does not capture that.

Let us turn now to the aggregate results. As mentioned, Tables 6-11 report various economy-wide changes for each of the countries/regions of the model. These include changes in exports and imports in millions of dollars, the changes in terms of trade, real wage rate and real return to capital in percentages, and changes in economic welfare measured by equivalent variation, both in millions of dollars and as percent of country GDP. The terms of trade is the world price of a country's exports relative to its imports. The equivalent variation is the amount of money that, if given to the country's consumers at initial prices, would be equivalent in terms of their level of welfare to the effects of the assumed liberalization. In general, as discussed above, a worsening (fall) in a country's terms of trade has an adverse effect on its consumers' welfare. But this can be outweighed by the other gains from trade due to economic efficiency and the other benefits modeled by the New Trade theory.

UR1: Elimination of the MFA Quota Constraints – The quota constraints of the Multi-Fibre Arrangement (MFA) on exports of textiles and apparel have been modeled in terms of their export-tax equivalents for the developing countries subject to these constraints. While the removal of the MFA quotas is being phased in over a 10-year period, from 1995-2005, we assume for computational purposes that they are removed all at one time. The results in Table 6 indicate that, with increased exports of these goods to world markets, their prices fall and all developing countries in the model except Korea and Singapore suffer a worsening of their terms of trade. Some of these countries also suffer a small loss in economic welfare, but others gain in spite of the terms-of-trade loss, presumably because their exports under the MFA were most restricted. The greatest gainers, as percentages of their GDP, are India, Hong Kong, the Philippines, and the Rest of South Asia group, all of which record gains that are more than half of one percent of their GDP. Most of the developed countries also gain from MFA elimination, although neither their gains, nor the losses of the few losers—Australia/New Zealand and Japan—are particularly large.

Interestingly, while trade expands by quite a bit for most countries in this scenario, it does not expand for all. Japan, especially, experiences such a worsening of its terms of trade that it can afford only lower imports in return for somewhat larger exports. Likewise, Singapore, Malaysia, and several non-Asian LDCs experience small reductions in both exports and imports.

Changes in returns to labor and capital are quite small and mostly, but not all, positive. The biggest gainers in terms of factor owners are labor in Hong Kong and the Philippines, where real wages rise by more than one percent. Otherwise, most of the changes in real factor prices are within a tenth or two of a percent of zero.

UR2: Full Uruguay Round Liberalization – Table 7 reports the full effects of the Uruguay Round liberalization, to the extent that we have been able to model it. The table shows a substantial increase in both exports and imports for all countries, and an improvement in economic welfare for all countries except Mexico, whose NAFTA preference margins may have been eroded due to the multilateral reductions in U.S. trade barriers. With liberalization of both tariffs and nontariff barriers in all sectors combined, India's welfare increases by 1.1% of GDP, Sri Lanka by 1.7%, and the Rest of South Asia (RSA) by 3.2%. While the welfare increases for the developed countries are smaller in relative terms, their total absolute gain of $115.5 billion is

72% of the world total of $159.7 billion. The overall gains for all countries in the model except Mexico are shared by both labor and capital.

As mentioned earlier, we used scenario UR2 as the basis for updating our database to the year 2005, which is the base for our subsequent scenarios for a new round of liberalization. The GTAP data for 1995 were first scaled up by constant growth rates for labor and output to get estimates of output, employment, and trade for the year 2005 in the absence of the Uruguay Round liberalization. We then used the detailed results of scenario UR4 to adjust these data further to include the changes that the Uruguay Round can be expected to bring about. Thus, for example, the trade data for each country in the model were expanded by the percentages implicit in columns 3 and 4 of Table 7. Of course, this was actually done using the disaggregated results for percentage changes in output, trade, and employment that are applied to the scaled levels from the GTAP data.

We turn now to the Millennium Round Scenarios.

MR1: Agricultural Liberalization – We begin our analysis of potential future liberalization with agriculture, since textiles and apparel have already been fully liberalized under the commitments of the Uruguay Round. Scenario MR1 therefore starts with the post-Uruguay Round tariffs in agriculture, including the often quite sizable tariffs that resulted from Uruguay Round tariffication of previous nontariff barriers. In our scenario, we assume that these tariffs are reduced by one-third as part of a new round of liberalization.

Table 8 reports the aggregate results of this exercise, in the same form as the tables for the two Uruguay Round scenarios above. In this case, as tariff reductions divert demand rather than supply onto world markets, we see relative prices of agricultural goods rise rather than fall, and the terms of trade of agricultural exporters such as the United States, Australia, New Zealand, and Canada all improve. The welfare effects of these changes are quite small, however, and a number of countries, including the United States, are shown as losing a negligible amount of welfare. The reason for this loss is a bit difficult to determine, since it is so small, although we suspect that it results from drawing resources into agriculture and out of sectors where scale economies made them more productive.

The biggest gainers from agricultural liberalization in this scenario are India, Sri Lanka, and RSA, plus China and South Korea. Their gains are likely the straightforward implications of comparative advantage, combined with their high initial trade barriers.

MR2: Tariff Reductions on Minerals and Manufactures – Table 9 reports results of tariff reductions outside of agriculture. Here again we assume for illustrative purposes that post-Uruguay round tariffs are reduced by one-third. Even though these tariffs tend to be lower than in agriculture, the gains from their reduction are considerably larger because they apply to so much more of the world economy. Since developed country exports bulk large in these industries, it is the terms of trade of the developed countries that improve most clearly in this scenario. However, even though many of the Asian economies experience worsening of their terms of trade, the model shows them gaining welfare even more than the developed countries, particularly as percentages of their GDPs. This, again, is due to their high tariffs and the economic inefficiencies as well as other losses that are associated with them. India's welfare increases by 0.7% of GDP, Sri Lanka by 2.8%, and RSA by 1.8%. As was the case in the UR4 scenario, we see here that, while the relative increases in GDP are smaller for the developed countries, their total absolute gain of $100.9 billion is 23% of the world total of $137.8 billion.

MR3: Services Liberalization – Although the Uruguay Round was the first round of multilateral trade negotiations to deal at all with trade in services, it really did not succeed in reducing any barriers to speak of. That is why our UR2 scenario did not include any services liberalization. However, the Uruguay Round did set up a framework, in the form of the General Agreement on Trade in Services (GATS), for future negotiations to reduce such barriers, and it is widely presumed that any future negotiations will make progress in this area. Therefore, our third scenario for the Millennium Round focuses on services liberalization.

To model barriers to trade in services, we treat them simply as tariffs on services trade, even though in fact levying tariffs on trade in services is certainly not done, and is probably not even possible for most services. Nonetheless, by the same reasoning as for the use of tariff equivalents for modeling NTBs, tariffs on trade in services may provide a first approximation to the effects of more complex actual barriers.[12]

More difficult is to determine what the sizes of barriers to trade in services actually are. Here we draw upon Hoekman (1995), who constructed what he acknowledged to be *ad hoc*

"guesstimates" of *ad valorem* barriers to trade in services, based largely upon offers that countries tabled during the services negotiations of the Uruguay Round. In scenario MR3 we use these guesstimates, reducing the model's tariff equivalents on imports of services by one third of these amounts.

The aggregate results are shown in Table 10. Once again, trade of all countries in the model expands, and welfare of all countries improves, this time by noticeably more than in the earlier scenarios. Welfare increases in India by 1.6% of GDP, Sri Lanka by 2.8%, and RSA by 1.9%. The largest percentage gains accrue to Hong Kong, Thailand, and Singapore. The potential welfare benefits from the liberalization of services barriers are five times greater in total than from the liberalization of minerals and manufactures. While the developed countries gain of $440.8 billion is 80% of the $687.9 billion total, the absolute gains for the developing are nonetheless quite large. This is indicative of the importance to both developed and developing countries of pursuing services liberalization in the forthcoming WTO negotiations.[13]

MR4: Combined Effects of MR1, MR2, and MR3 –Our final multilateral scenario here combines the 33% reductions in barriers for all sectors: agriculture; mining and manufactures; and services. This is simply the combination and summation of scenarios MR1 through MR3. The results appear in Table 11.

Not surprisingly, both the welfare and the terms-of-trade effects are similar to those in scenario MR3, since the services liberalization turns out to dominate the liberalization in the other sectors. Trade expands by quite a bit more here than in MR3, since the other sectors include a larger amount of trade being liberalized. But because the initial barriers themselves are so high, the welfare effects of services liberalization appear to be the most important for the well being of the countries involved. Of course, this conclusion is critically dependent on the large size of Hoekman's guesstimates of barriers, as well as on the assumption that they can be significantly reduced through negotiations.

Sectoral Impact of Trade Liberalization on India

A major contribution that this sort of CGE modeling can make is to identify those sectors that will expand and those that will contract as a result of various patterns of trade liberalization, as well as the sizes of these changes. Given our assumption that expenditure adjusts within each country to maintain a constant level of total employment, it is necessarily the case that each

country experiences a mixture of expansions and contractions at the industry level. This must be true of employment, and it is likely to be true as well for industry output. Detailed sectoral results are available for all the countries/regions included in the model and are available on request. We shall concentrate here then on the sectoral results for India that are given in Tables 12 and 13 in the UR4 and MR4 scenarios.

It is expected that trade liberalization will stimulate production of labor-intensive sectors in India. Productive resources would then get allocated more efficiently as compared to the pre-liberalization situation as India would specialize in the sectors where it has comparative advantage. There may of course be transitional costs due to intersectoral movement of factors of production. Beyond such welfare gains, trade liberalization is also expected to have a "pro-competitive" effect on domestic firms, resulting in additional gains from the realization of economies of large-scale production. When firms get protection from foreign competition through tariff and non-tariff barriers, they may take advantage of their market power by raising their prices and reducing their domestic sales. The result is that the protected firms may produce below their minimum-cost, efficient plant size. Trade liberalization should then bring about competitive pressures on the formerly protected firms and induce them to raise production and productivity and also to achieve more efficient plant size and lower per unit costs. Thus, gains in economic welfare are expected to come from improved allocation of resources, lower prices to consumers and business firms, and availability of more varieties to consumers and firms. The realization of economies of scale in manufacturing also reinforces the welfare enhancing effect.

It can be seen in Tables 12 and 13 that wearing apparel is the single largest gaining sector, with increased output of 28.9% under UR4 and an additional 10.7% under MR4. Other output-gaining sectors under MR4 include mining and quarrying (4.1%); leather, wood, paper and their products (2.3%); textiles (1.8%); food, beverages, and tobacco (0.3%); non-metallic mineral products (0.3%); and manufactures including electronics equipment (10.7%). Output declines in other manufacturing sectors as well as in agriculture.

The changes in number of firms is indicated for the ten manufacturing sectors that are modeled as monopolistically competitive. These changes are consistent with the changes in output. The scale effect, which is the percent change in the output per firm, is positive in all the manufacturing sectors.[14]

The changes in sectoral exports and imports under the MR4 scenario indicate that the largest export-gaining manufacturing sectors, in percentage terms, include: wearing apparel; (16.6%); textiles (9.7%); and leather, wood, paper and their products (9.4%). The highest import gaining manufacturing sectors, in percentage terms, include: wearing apparel (23.2%); textiles (19.2%); food, beverages, and tobacco (18.9%); manufactures, including electronics equipment (17.8%); and non-metallic mineral products (13.2%). While exports of agriculture increase by 9.1%, imports increase by 8.2%. Trade in the service sectors increases markedly in proportional terms.

Unilateral Liberalization by India

In earlier work by Chadha et al. (1998a,b), the impacts of India's unilateral, post-1991 economic reforms were analyzed, using a stand-alone model of the Indian economy in which the rest-of-the-world was assumed not to undertake any liberalization. It is interesting in this light to consider how India would be affected by multilateral liberalization in the forthcoming WTO negotiations as compared to what it might undertake unilaterally. For this purpose, we repeated the MR1-MR4 scenarios for India on a unilateral basis. The results are reported in Table 14 together with the results of the multilateral scenarios for India noted in Tables 8-11. It is clear that India would gain if it undertook unilateral liberalization. But the increases in welfare and the returns to labor and capital are noticeably higher with the assumed multilateral scenarios.

IV. Conclusions and Implications for Policy

The failure of the Third WTO Ministerial Conference at Seattle has led to a temporary setback to the launch of a new round of multilateral trade negotiations. Despite the consequent uncertainties, the built-in agenda from the Uruguay Round has been mandated for negotiations on agricultural and services liberalization to commence in the year 2000. In this paper, we have provided computational estimates of the economic effects that might be realized from trade liberalization for India and other major trading countries/regions in the Uruguay Round and in a new negotiating round.

An important message that emerges is that multilateral liberalization enhances the economic welfare of the major trading countries/regions. The expected welfare gain of the world is close to 0.5% over the extrapolated 2005 GTAP database that incorporates the implementation

of the Uruguay Round negotiations. There are significant additional gains from the assumed Millennium Round liberalization.

India's welfare gain is 1.1% ($4.7 billion over its 2005 GDP)) when the UR scenarios get fully implemented. India's additional welfare gain amounts to 2.7% ($11.4 billion) when the assumed Millennium Round multilateral trade liberalization is completed. Resources in India resources are allocated towards labor-intensive sectors such as textiles, wearing apparel, leather and leather products, and food, beverages, and tobacco. Real returns to both labor and capital increase. The scale effect (percent change in output per firm) is positive for all the ten sectors of manufacturing. Finally, it pays even if India were to undertake unilateral trade liberalization of the order indicated in the multilateral scenarios, with other countries not undertaking any further liberalization.

The gains from the liberalization scenarios that have been noted should of course be interpreted in the light of the assumptions of our modeling structure. In particular, our computational model abstracts from the effects of macroeconomic changes and policies. Also, we do not capture the effects of dynamic changes in efficiency and economic growth. We have also not analyzed the effects of possible changes in inflows of foreign direct investment. Finally, the analysis of intersectoral employment shifts makes no allowance for the constraining effects of India's sectoral exit barriers and its domestic labor laws.

Table 1. India: Tariff Structure, 1990/91 to 1997/98 (Percent)

	1990/91[a] Applied[e]	1993/94[b] Applied[e]	1995/96 Applied[e]	1996/97[c] Applied[e]	1997/98[d] Applied[e]
Average Unweighted					
Agriculture	113	43	27	26	26
Mining	100	70	30	26	25
Manufacturing	126	73	42	40	36
Whole economy	125	71	41	39	35
Index of dispersion[f]	32	42	47	49	42
Maximum tariff rate[g]	355	85	50	52	45
Average Weighted[h]	87	47	25	22	20

a) Prior to reform package of July 1991. Includes auxiliary duty mostly at 45%.
b) The auxiliary duty was merged with the basic customs duty in the 1993/94 budget.
c) Includes special rate of 2%.
d) Includes special rate of 5%.
e) Effective m.f.n. rate, i.e., actual rates applied where basic rates have been reduced by exempt rates. However, many exempt rates cannot be incorporated such as where the exempt rate applies to only a part of the HS six digit tariff line. The effective rate also excludes specific exemptions.
f) Index of dispersion for the whole economy as measured by the coefficient of variation, percentage points.
g) Higher than the so-called maximum rate is applied to a few items; in 1997/98, 0.4 percent of tariff lines.
h) Weighted by 1992/93 import values.

Note: Tariff averages consider only those tariff lines with ad valorem rates. Year beginning 1 April. Classification used is based on the International Standard Industrial Classifications(ISIC): Agriculture = ISIC 1; Mining = ISIC 2; Manufacturing = ISIC 3, including food processing.

Source: WTO, *Trade Policy Review : India 1998*, p. 46.

Table 2. India: Tariffs by Products, Average Import-Weighted Rates, 1990-98 (Percent)

	1990/91	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
Consumer Goods	153	131	86	48	36	33	25
Intermediate Goods	77	55	42	31	22	19	18
Capital Goods	97	74	50	37	29	29	24

Note: Year beginning April 1.

Source: WTO, *Trade Policy Review: India 1998*, p. 49.

Table 3. India: Bound Tariff Rates and Applied Rates of Duty (Percent)

	Bound rate of duty[a] by year 2005	Applied rate of duty[b] 1997/98
Average unweighted tariff (percent)		
Agriculture (ISIC 1)	94	26
Mining (ISIC 2)	36	25
Manufacturing (ISIC 3, includes food processing)	52	36
Whole economy	54	35
Average unweighted tariff by stage of processing (percent)		
Unprocessed	74	25
Semi-processed	44	35
Processed	56	37

a) Includes only items bound during the Uruguay Round. The bound rates do not include the commitments under the Information Technology Agreement
b) Effective m.f.n. rate, i.e., actual rates applied where basic rates have been reduced by exempt rates. However, many exempt rates cannot be incorporated such as where the exempt rate applies to only a part of the HS six digit tariff line. The effective rate also excludes specific exemptions.

Note: Tariff averages consider only those tariff lines with ad *valorem rates*, Year beginning 1 April

Source: WTO, *Trade Policy Review: India 1998*, p. 54.

Table 4. Countries/Regions of the Model

COUNTRIES/REGIONS	CODE
(1)	(2)
1.Developed	
Australia and New Zealand	ANZ
Canada	CAN
European Union and EFTA	EUF
Japan	JPN
United States	USA
2. Developing	
2.a Asian	
India	IND
Sri Lanka	LKA
Rest of South Asia	RSA
China	CHN
ong Kong	HKG
Korea	KOR
Singapore	SGP
Indonesia	IDN
Malaysia	MYS
Philippines	PHL
Thailand	THA
2. b Other	
Mexico	MEX
Turkey	TUR
Central European Associates	CEA
Central and South America and Associates	A_N

Table 5: Sectors of Production

SN	COMMODITY	CODE
1	Agriculture	AGR
2	Mining and Quarrying	MIN
3	Food, Beverages, and Tobacco	FBT
4	Textiles	TEX
5	Wearing Apparel	WAP
6	Leather, Wood, and Paper & Products	LWP
7	Chemicals, Rubber, Plastic, and Petroleum Products	CRP
8	Non-Metallic Mineral Products	NMM
9	Metal and Metal Products	MMP
10	Transport and Machinery Equipment & Parts	TEM
11	Manufactures, including Electronic Equip.	OMF
12	Electricity, Gas, and Water	EGW
13	Construction	CNS
14	Trade and Transport	T_T
15	Finance, Business, and Recreational Services	OSP
16	Public Administration, Defense, Education and Health & Dwellings	RSR

Table 6. UR1:Complete Elimination of Export-Tax Equivalents of MFA Quota Constraints

COUNTRIES/REGIONS	CODE	IMPORTS Million Dollars	EXPORTS Million Dollars	TERMS OF TRADE Percent Change	EQUIVALENT VARIATION Percent Change	EQUIVALENT VARIATION Million Dollars	WAGE RATE Percent Change	RETURN TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**8897**	**6812**	**--**	**0.0**	**5310**	**--**	**--**
Australia & New Zealand	ANZ	131	104	0.0	-0.0	-56	0.0	0.0
Canada	CAN	698	620	0.1	0.1	1087	0.0	0.1
EUN and EFTA	EUF	2202	1924	0.1	0.0	818	0.0	0.0
Japan	JPN	-25	262	-0.0	-0.0	-2209	-0.0	0.0
USA	USA	5890	3903	0.1	0.1	5671	0.0	0.1
2. Developing		**7889**	**10245**	**--**	**0.1**	**3077**	--	--
2.a Asian		**8302**	**10453**	**--**	**0.2**	**4579**	--	--
India	IND	1528	1980	-0.9	0.6	2485	0.1	0.2
Sri Lanka	LKA	47	107	-1.1	0.2	30	-0.1	0.2
Rest of South Asia	RSA	455	641	-1.0	0.5	628	0.1	0.2
China	CHN	2259	3130	-0.3	0.1	726	0.1	-0.0
Hong Kong	HKG	2106	2253	-0.2	0.8	1074	1.2	0.1
Korea	KOR	420	414	0.0	-0.0	-158	0.0	-0.0
Singapore	SGP	-353	-398	0.0	-0.2	-154	-0.0	0.0
Indonesia	IDN	105	163	-0.1	-0.1	-237	0.0	-0.0
Malaysia	MYS	-123	-92	-0.0	-0.1	-167	0.1	-0.0
Philippines	PHL	1706	1999	-0.9	0.6	517	1.6	-0.3
Thailand	THA	152	257	-0.1	-0.1	-165	0.2	-0.0
2. b Other		**-412**	**-209**	**--**	**-0.1**	**-1501**	--	--
Mexico	MEX	-68	11	-0.0	-0.1	-252	-0.0	-0.0
Turkey	TUR	-137	-98	-0.1	-0.1	-217	-0.0	-0.0
Central European Associates	CEA	-40	-20	-0.0	-0.0	-83	-0.0	0.0
Central, South America etc	A_N	-167	-102	-0.1	-0.1	-950	-0.0	-0.0
3. World Total		**16787**	**17056**	**--**	**0.0**	**8388**	--	--

Table 7. UR2: Elimination of MFA Quota Constraints, Agricultural Liberalization, and Liberalization of Minerals and Manufactures

COUNTRIES/REGIONS	CODE	IMPORTS Million Dollars	EXPORTS Million Dollars	TERMS OF TRADE Percent Change	EQUIVALENT VARIATION Percent Change	EQUIVALENT VARIATION Million Dollars	WAGE RATE Percent Change	RETURN TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**83792**	**77989**	**--**	**0.4**	**115546**	**--**	**--**
Australia & New Zealand	ANZ	3960	3436	0.5	0.6	3214	0.4	0.6
Canada	CAN	2748	2624	0.1	0.3	2271	0.2	0.3
EUN and EFTA	EUF	31410	27870	0.4	0.4	48037	0.2	0.2
Japan	JPN	13326	11563	0.4	0.3	21357	0.1	0.2
USA	USA	32347	32497	-0.2	0.4	40667	0.3	0.4
2. Developing		**64157**	**69914**	**--**	**0.8**	**44143**	--	--
2.a Asian		**51209**	**57160**	**--**	**1.3**	**37123**	--	--
India	IND	4522	6012	-3.0	1.1	4738	0.5	0.7
Sri Lanka	LKA	212	297	-1.7	1.7	286	1.1	1.4
Rest of South Asia	RSA	3994	5473	-8.3	3.2	3749	1.9	2.2
China	CHN	22091	25809	-1.3	1.5	13330	1.0	0.9
Hong Kong	HKG	3150	2646	0.5	1.3	1700	1.8	0.7
Korea	KOR	4392	3702	0.4	0.8	4741	0.4	0.4
Singapore	SGP	2794	2243	0.3	1.6	1221	2.0	2.3
Indonesia	IDN	1346	1287	0.1	0.5	1194	0.5	0.2
Malaysia	MYS	1888	2174	-0.2	1.1	1310	1.6	1.4
Philippines	PHL	5112	6050	-3.0	3.3	2913	3.6	1.7
Thailand	THA	1707	1467	0.2	0.9	1941	1.0	0.3
2. b Other		**12948**	**12753**	**--**	**0.3**	**7020**	--	--
Mexico	MEX	324	460	-0.0	-0.2	-795	0.2	-0.2
Turkey	TUR	477	318	0.3	0.5	1007	0.1	0.2
Central European Associates	CEA	2581	2248	0.2	0.5	1814	0.3	0.3
Central, South America etc	A_N	9565	9727	-0.2	0.3	4994	0.1	-0.0
3. World Total		**147949**	**147903**	**--**	**0.5**	**159689**	--	--

Table 8. MR1: 33 Percent Bilateral Reduction in Post-Uruguay Round Tariffs on Agricultural Products

COUNTRIES/REGIONS	CODE	IMPORTS Million Dollars	EXPORTS Million Dollars	TERMS OF TRADE Percent Change	EQUIVALENT VARIATION Percent Change	EQUIVALENT VARIATION Million Dollars	WAGE RATE Percent Change	RETURN TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**10934**	**10433**	**--**	**0.0**	**4390**	**--**	**--**
Australia & New Zealand	ANZ	706	418	0.3	0.0	79	-0.0	-0.1
Canada	CAN	203	-79	0.1	0.0	85	-0.0	-0.0
EUN and EFTA	EUF	2504	2412	-0.0	0.0	2742	0.0	0.0
Japan	JPN	3105	4166	-0.2	0.0	2675	0.1	0.1
USA	USA	4417	3515	0.1	-0.0	-1191	-0.0	-0.0
2. Developing		**5522**	**5386**	**--**	**0.1**	**5751**	--	--
2.a Asian		**3863**	**4177**	**--**	**0.2**	**5500**	--	--
India	IND	249	253	-0.0	0.4	1541	0.0	0.0
Sri Lanka	LKA	36	33	0.1	0.4	59	0.1	0.0
Rest of South Asia	RSA	184	224	-0.1	0.7	801	0.1	0.2
China	CHN	836	595	0.0	0.2	1496	0.0	0.0
Hong Kong	HKG	93	136	0.0	-0.0	-8	0.0	0.0
Korea	KOR	1051	1465	-0.2	0.2	925	0.2	0.2
Singapore	SGP	237	238	0.0	0.1	53	0.2	0.2
Indonesia	IDN	156	113	0.0	0.0	113	0.0	-0.0
Malaysia	MYS	456	527	-0.1	0.3	377	0.2	0.2
Philippines	PHL	254	315	-0.1	0.3	235	0.1	0.2
Thailand	THA	311	278	0.1	-0.0	-92	0.3	-0.1
2. b Other		**1659**	**1209**	**--**	**0.0**	**252**	--	--
Mexico	MEX	52	-80	0.1	0.0	40	0.0	-0.0
Turkey	TUR	257	285	-0.0	0.2	396	0.0	0.1
Central European Associates	CEA	310	269	0.1	0.0	31	0.0	-0.0
Central, South America etc	A_N	1042	735	0.2	-0.0	-215	-0.0	-0.1
3. World Total		**16456**	**15819**	**--**	**0.0**	**10141**	--	--

Table 9. MR2: 33 Percent Bilateral Reduction of Post-Uruguay Tariffs on Minerals and Manufactures

COUNTRIES/REGIONS	CODE	IMPORTS	EXPORTS	TERMS	EQUIVALENT VARIATION		WAGE	RETURN
		Million Dollars	Million Dollars	OF TRADE Percent Change	Percent Change	Million Dollars	RATE Percent Change	TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**70352**	**64526**	**--**	**0.4**	**100858**	**--**	**--**
Australia & New Zealand	ANZ	3565	3346	0.2	0.4	2127	0.3	0.4
Canada	CAN	1887	2047	-0.0	0.3	2337	0.1	0.2
EUN and EFTA	EUF	27226	26326	0.1	0.4	40522	0.1	0.2
Japan	JPN	18451	15250	0.5	0.6	37431	0.1	0.2
USA	USA	19223	17558	0.1	0.2	18441	0.1	0.2
2. Developing		**61014**	**67140**	**--**	**0.7**	**36912**	--	--
2.a Asian		**46965**	**50782**	**--**	**1.0**	**29215**	--	--
India	IND	3161	3934	-1.4	0.7	3031	0.3	0.5
Sri Lanka	LKA	386	450	-1.2	2.8	475	1.3	1.7
Rest of South Asia	RSA	1781	1895	-0.6	1.8	2078	0.6	0.9
China	CHN	16845	19962	-1.1	0.8	6885	0.8	0.8
Hong Kong	HKG	3051	1906	1.1	1.4	1746	1.3	0.9
Korea	KOR	7356	7448	-0.1	1.0	5566	0.6	0.4
Singapore	SGP	2840	2133	0.4	1.4	1017	1.7	1.7
Indonesia	IDN	2037	2015	0.0	0.6	1578	0.6	0.3
Malaysia	MYS	2951	3233	-0.3	1.6	1919	2.0	2.0
Philippines	PHL	3400	3959	-1.4	3.3	2853	2.4	1.7
Thailand	THA	3158	3848	-0.8	1.0	2067	1.7	1.0
2. b Other		**14049**	**16358**	**--**	**0.3**	**7697**	--	--
Mexico	MEX	956	1174	-0.2	0.4	1342	0.2	0.2
Turkey	TUR	1331	1453	-0.3	0.8	1645	0.3	0.2
Central European Associates	CEA	3708	4149	-0.4	0.6	2199	0.6	0.5
Central, South America etc	A_N	8053	9582	-0.8	0.1	2510	0.1	0.1
3. World Total		**131366**	**131666**	**--**	**0.4**	**137770**	--	--

Table 10. MR3: 33 Percent Bilateral Reduction in Tariff Equivalents of Services Barriers

COUNTRIES/REGIONS	CODE	IMPORTS Million Dollars	EXPORTS Million Dollars	TERMS OF TRADE Percent Change	EQUIVALENT VARIATION Percent Change	EQUIVALENT VARIATION Million Dollars	WAGE RATE Percent Change	RETURN TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**172892**	**174574**	**--**	**2.0**	**550780**	**--**	**--**
Australia & New Zealand	ANZ	7632	8110	-0.6	2.9	15115	0.8	0.9
Canada	CAN	9766	10207	-0.2	2.8	20226	0.8	0.9
EUN and EFTA	EUF	62706	64920	-0.1	1.9	210118	0.3	0.3
Japan	JPN	35598	39455	-0.6	1.9	125563	0.3	0.4
USA	USA	57191	51882	0.5	2.0	179758	0.5	0.4
2. Developing		**85237**	**85166**	**--**	**2.5**	**137085**	--	--
2.a Asian		**56111**	**56232**	**--**	**2.4**	**70476**	--	--
India	IND	2028	2152	-0.2	1.6	6840	0.3	0.4
Sri Lanka	LKA	508	590	-1.5	2.8	476	2.0	2.2
Rest of South Asia	RSA	945	954	-0.1	1.9	2186	0.4	0.6
China	CHN	8398	9235	-0.2	1.3	11812	0.5	0.5
Hong Kong	HKG	14933	13721	1.1	8.3	10540	5.9	6.1
Korea	KOR	10890	11454	-0.3	2.7	15527	1.0	1.1
Singapore	SGP	3659	2463	0.7	3.8	2827	6.8	5.0
Indonesia	IDN	2402	2481	-0.1	2.4	6169	0.6	0.5
Malaysia	MYS	2181	2153	0.0	1.9	2301	1.1	1.0
Philippines	PHL	2910	3138	-0.7	3.5	3065	2.3	2.4
Thailand	THA	7257	7890	-0.8	4.2	8733	4.1	3.3
2. b Other		**29125**	**28934**	**--**	**2.5**	**66609**	--	--
Mexico	MEX	4136	4218	-0.1	3.0	10699	0.8	0.9
Turkey	TUR	4436	3450	2.2	3.5	7390	1.0	1.9
Central European Associates	CEA	8481	8326	0.1	2.5	9132	1.4	1.3
Central, South America etc	A_N	12073	12939	-0.5	2.3	39388	0.4	0.5
3. World Total		**258128**	**259740**	**--**	**2.1**	**687865**	--	--

Table 11. MR4: 33 Percent Bilateral Tariff Reductions in All Sectors Combined (MR1, MR2 and MR3)

COUNTRIES/REGIONS	CODE	IMPORTS Million Dollars	EXPORTS Million Dollars	TERMS OF TRADE Percent Change	EQUIVALENT VARIATION Percent Change	EQUIVALENT VARIATION Million Dollars	WAGE RATE Percent Change	RETURN TO CAPITAL Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.Developed		**254179**	**249532**	**--**	**2.4**	**656028**	**--**	**--**
Australia & New Zealand	ANZ	11903	11874	-0.0	3.4	17320	1.1	1.1
Canada	CAN	11855	12176	-0.1	3.1	22648	0.9	1.0
EUN and EFTA	EUF	92436	93657	-0.0	2.3	253381	0.5	0.5
Japan	JPN	57153	58871	-0.2	2.5	165669	0.5	0.7
USA	USA	80831	72955	0.7	2.2	197009	0.6	0.5
2. Developing		**151772**	**157692**	**--**	**3.2**	**179748**	--	--
2.a Asian		**106939**	**111191**	**--**	**3.6**	**105191**	--	--
India	IND	5438	6340	-1.6	2.7	11412	0.6	1.0
Sri Lanka	LKA	930	1074	-2.6	6.0	1010	3.3	3.9
Rest of South Asia	RSA	2910	3074	-0.8	4.4	5065	1.1	1.7
China	CHN	26078	29791	-1.2	2.2	20193	1.4	1.3
Hong Kong	HKG	18076	15763	2.2	9.6	12277	7.2	7.1
Korea	KOR	19297	20367	-0.6	3.9	22018	1.8	1.7
Singapore	SGP	6735	4834	1.2	5.2	3897	8.6	6.9
Indonesia	IDN	4595	4609	0.0	3.1	7859	1.1	0.8
Malaysia	MYS	5587	5913	-0.3	3.8	4598	3.3	3.2
Philippines	PHL	6564	7411	-2.2	7.0	6153	4.7	4.3
Thailand	THA	10727	12016	-1.5	5.2	10708	6.1	4.2
2. b Other		**44833**	**46501**	**--**	**2.8**	**74558**	--	--
Mexico	MEX	5144	5312	-0.2	3.4	12081	1.0	1.0
Turkey	TUR	6024	5188	1.9	4.5	9432	1.3	2.2
Central European Associates	CEA	12499	12743	-0.2	3.1	11363	1.9	1.8
Central, South America etc	A_N	21167	23257	-1.2	2.4	41682	0.5	0.4
3. World Total		**405951**	**407224**	**--**	**2.5**	**835776**	--	--

Table 12. UR4: Sectoral Effect on Exports, Imports, Output, Number of Firms, and Change in Employment in India

SN	COMMODITY	CODE	EXPORTS	IMPORTS	OUTPUT	NO. of FIRMS	SCALE EFFECT	CAPITAL	EMPLOYMENT	
									PERCENT	TOTAL
1	Agriculture	AGR	1.7	-1.3	-0.1	--	--	-0.2	-0.1	-275754
2	Mining and Quarrying	MIN	4.8	-1.4	1.7	1.0	0.7	1.3	1.3	38025
3	Food, Beverages, and Tobacco	FBT	11.0	17.6	0.6	0.3	0.3	0.3	0.6	59522
4	Textiles	TEX	18.6	6.5	4.0	3.1	0.9	3.3	3.6	373078
5	Wearing Apparel	WAP	54.1	-6.9	28.9	27.9	1.0	28.3	28.6	207899
6	Leather, Wood, and Paper & Products	LWP	6.8	28.6	-0.6	-1.2	0.6	-1.1	-0.8	-56635
7	Chemicals, Rubber, Plastic & Petr. Prod	CRP	5.6	13.3	-1.3	-1.9	0.6	-1.7	-1.4	-23622
8	Non-Metallic Mineral Products	NMM	7.7	23.2	-0.6	-1.2	0.6	-1.3	-1.0	-30563
9	Metal and Metal Products	MMP	5.3	8.1	-2.7	-3.1	0.4	-3.1	-2.7	-85391
10	Transport and Machinery Equipment & Parts	TEM	4.6	18.9	-5.1	-6.0	0.9	-6.2	-5.8	-195812
11	Manufactures, including Electronic Equip.	OMF	-0.2	24.7	-1.0	-1.5	0.5	-1.6	-1.3	-59981
12	Electricity, Gas, and Water	EGW	3.2	-2.2	1.0	--	--	0.3	0.6	9594
13	Construction	CNS	3.2	-2.7	-0.5	--	--	-0.5	-0.1	-14447
14	Trade and Transport	T_T	2.2	-3.3	0.1	--	--	-0.2	0.2	89911
15	Finance, Business, and Recreational Services	OSP	2.0	-2.8	-0.5	--	--	-0.4	-0.1	-2455
16	Public Admn, Defense, Edn, Health & Dwellings	RSR	1.2	-2.3	-0.5	--	--	-0.4	-0.1	-33369
	All Sectors		12.1	9.1	0.2	0.0	--	--	0.0	0

Note: All figures are in percent unless specified

Table 13. MR4: Sectoral Effect on Exports, Imports, Output, Number of Firms, and Change in Employment in India

SN	COMMODITY	CODE	EXPORTS	IMPORTS	OUTPUT	NO. of FIRMS	SCALE EFFECT	CAPITAL	EMPLOYMENT	
									PERCENT	TOTAL
1	Agriculture	AGR	9.1	8.2	-0.1	--	--	-0.2	-0.1	-229492
2	Mining and Quarrying	MIN	7.5	-3.2	4.1	3.0	1.1	3.3	3.4	100167
3	Food, Beverages, and Tobacco	FBT	7.3	18.9	0.3	-0.2	0.5	-0.2	0.3	25475
4	Textiles	TEX	9.7	19.5	1.8	1.1	0.8	1.2	1.6	166091
5	Wearing Apparel	WAP	16.6	23.3	10.7	9.9	0.8	10.1	10.6	76751
6	Leather, Wood, and Paper & Products	LWP	9.4	4.6	2.3	1.5	0.8	1.6	2.1	155858
7	Chemicals, Rubber, Plastic & Petr. Prod.	CRP	7.1	7.9	-0.3	-1.1	0.8	-0.9	-0.4	-7014
8	Non-Metallic Mineral Products	NMM	7.9	13.2	0.3	-0.6	0.8	-0.8	-0.4	-11246
9	Metal and Metal Products	MMP	5.9	9.9	-1.8	-2.6	0.8	-2.5	-2.0	-62549
10	Transport and Machinery Equipment & Parts	TEM	6.0	9.4	-2.1	-3.3	1.2	-3.6	-3.1	-104192
11	Manufactures, including Electronic Equip.	OMF	5.5	17.8	0.1	-0.9	1.0	-0.9	-0.5	-23092
12	Electricity, Gas, and Water	EGW	64.6	50.1	0.7	--	--	0.1	0.5	7881
13	Construction	CNS	21.3	19.2	-0.1	--	--	-0.3	0.2	20648
14	Trade and Transport	T_T	41.5	41.8	-0.6	--	--	-1.3	-0.7	-297355
15	Finance, Business, and Recreational Services	OSP	23.5	25.0	0.0	--	--	-0.4	0.1	1701
16	Public Admn, Defense, Edn, Health & Dwellings	RSR	21.9	17.0	0.7	--	--	-0.1	0.4	144329
	All Sectors		11.4	9.9	0.4	-0.2	--	--	0.0	0

Note: All figures are in percent unless specified

Table 14. Impact of Multilateral and Unilateral Trade Liberalization for India

	MR1	MR2	MR3	MR4
Multilateral				
Equivalent Variation				
Percent	0.4	0.7	1.6	2.7
Million US dollars	1541	3031	6840	11412
Returns to Factors, % change				
Wage Rate	0.0	0.3	0.3	0.6
Returns to Capital	0.0	0.5	0.4	1.0
Trade				
Imports (million US dollars)	249	3161	2028	5438
Exports (million US dollars)	253	3934	2152	6340
Unilateral				
Equivalent Variation				
Percent	0.4	0.3	1.3	2.0
Million US dollars	1709	1317	5350	8376
Returns to Factors, % change				
Wage Rate	0.0	0.2	0.0	0.2
Returns to Capital	0.1	0.5	0.3	0.8
Trade				
Imports (million US dollars)	134	2086	1070	3290
Exports (million US dollars)	197	3264	1599	5060

Multilateral

MR1: 33 percent bilateral reduction in post-Uruguay round tariffs on agricultural products
MR2: 33 percent bilateral reduction in post-Uruguay round tariffs on minerals and manufactures
MR3: 33 percent bilateral reduction in tariff equivalents of barriers to trade in services
MR4: 33 percent bilateral tariffs reduction in all sectors combined (MR1, MR2 and MR3)

Unilateral

India's unilateral :
MR1 : 33 percent reduction in post-Uruguay round tariffs on agricultural products
MR2 : 33 percent reduction in post-Uruguay round tariffs on minerals and manufactures
MR3 : 33 percent reduction in tariff equivalent of barriers to trade in services
MR4: 33 percent tariff reduction in all sectors combined (MR1, MR2 and MR3)

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ENDNOTES

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[1] Prior to the announcement of India's Export and Import Policy (1992-97), all imports unless specifically exempted required a license or a customs-clearance permit. All imports were classified under one of four main licensing types: restricted items; banned items; limited permissible items; and open general licenses (OGL). The items falling under OGL were only nominally unrestricted. In practice, many OGL imports required government approval, and most remained subject to actual user conditions. The system was made more complicated by applying different import and approval procedures between license types and frequently shifting products across licensing categories.

[2] The goods under licensing included: precious, semi-precious and other stones; safety, security and related items; seeds plants and animals; insecticides and pesticides; drugs and pharmaceuticals; chemicals and allied items; items relating to small scale sector; and miscellaneous and special categories.

[3] India implemented the Harmonized Commodity Description and Coding System (HS) for classifying imports and exports in February 1986. Although the Indian Customs Tariff Schedule is sub-divided into 5,134 standard HS six-digit codes (as of April 1, 1997), India uses a 10-digit HS classification for import-licensing purposes.

[4] The Chelliah Committee recommended seven different rates of customs tariff, namely 5, 10, 15, 20, 25, 30 and 50% to be achieved by 1997-98 (Govt. of India, Tax Reforms Committee, 1993). It was further suggested that additional or special protection might be given for a limited period to new industries, new products, or new technologies. The 5% rate was to apply to inputs for fertilizer and newsprint, 10 and 15% to other basic inputs, 20% to capital goods, and 25% to chemicals and intermediates. Other final products (excluding inessential consumer goods) would be charged 30% duty. Inessential consumer goods, if permitted for import, would have a duty rate of 50%.

While the multiple suggested tariff rates can be used to achieve the Committee's philosophy of systematic escalation according to the degree of processing, the result may be effective rates of protection that are much higher than the nominal tariffs on finished goods. Thus, for example, when QRs on consumer goods are removed, a 50% duty on imports of consumer goods combined with 25% or less duty on tradable inputs would lead to an effective rate of protection close to 100% (Joshi and Little, 1994, p. 76). This tariff escalation has been prevalent in India's economy throughout the 1990s. Whereas the simple average tariff on processed goods was 37% in 1997-98, that on unprocessed goods (primary products) had an average tariff of 25%. Significant tariff escalation is further evident in: paper and paper products; printing and publishing; wood and wood products; and food, beverages and tobacco (WTO, 1998, p. 19).

[5] India obtained the right to use QRs from GATT in 1949 for balance-of-payments reasons and retained it since. This right was reasserted in its Uruguay Round submissions. But, as noted below, these QRs are to be phased out by 2001.

[6] See Chadha (2000) for a more detailed analysis of India's services commitments and policies.

[7] Under the ATC agreement, quota growth rates will increase in stages over the decade from 1995-2005.. We assumed in our computations that the MFA quota constraints are eliminated all at once.

[8] The post-Uruguay Round tariff data were adapted from Francois and Strutt (1999).

[9] The ad valorem equivalents of services barriers were adapted from the "guesstimates" provided in Hoekman (1995).

[10] The agricultural sector in the model is assumed to be perfectly competitive, and the manufacturing and services sectors are assumed to be monopolistically competitive with free entry.

[11] For details, see Brown et al. (1993).

[12] See Brown and Stern (1999) for a CGE analysis in which the services barriers are modeled in terms of raising the cost of providing services through foreign direct investment.

[13] A similar conclusion was reached in earlier work by Brown et al. (1996).

[14] Scale effects were not calculated for the services sectors because of the lack of data on numbers of firms.